

Session: Condensed Matter Physics

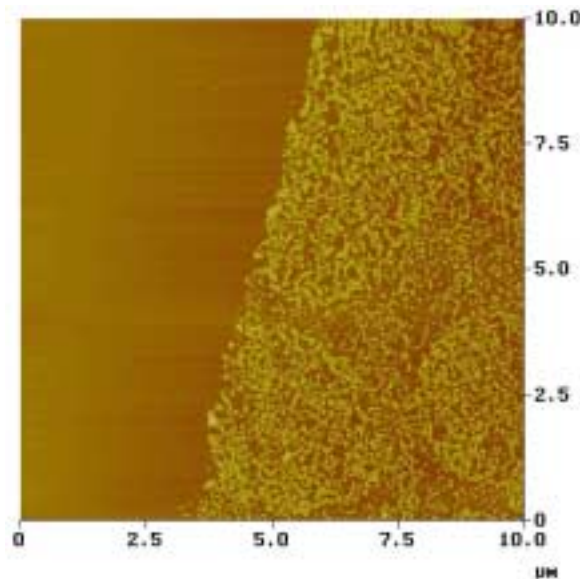
FABRICATION OF GOLD NANOSTRUCTURES ON SILICON THROUGH ELECTROLESS DEPOSITION

Wesley T. Ryle, Allen T. Newton, Robert A. Weller*

Western Kentucky University
Dept. of Physics and Astronomy
1 Big Red Way
Bowling Green, KY 42101-3576
Email: rylewt@wku.edu

ABSTRACT

A technique for patterning gold nanostructures on a silicon surface was developed through the use of an electroless gold bath. Oxidized silicon was patterned with an array of holes produced by a focused ion beam. These holes protruded through a thin silicon oxide layer revealing the silicon surface underneath. The exposed silicon was then etched in hydrofluoric acid, resulting in the hydrogen-termination of holes. In turn, this hydrogen-termination allowed for electroless gold deposition to occur selectively on the exposed silicon. The result of this process was an array of gold nanostructures that were area selective in deposition. Applications of such nanostructures is yet to be explored.



This figure displays the area-selectivity of the gold nanoparticle deposition through the use of a SiO₂ mask.